

**DOCKET NO.:** UPFF-0004 / N2437  
**Application No.:** 10/053,085  
**Office Action Dated:** October 9, 2008

**PATENT**

In re Application of:	Confirmation No.: <b>5527</b>
<b>Raymond J. Gorte and John M. Vohs</b>	
Application No.: <b>10/053,085</b>	Group Art Unit: <b>1795</b>
Filing Date: <b>November 9, 2001</b>	Examiner: <b>Wang, Eugenia</b>
For: <b>Use of Sulfur-Containing Fuels for Direct Oxidation Fuel Cells</b>	

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**DECLARATION OF DR. RAYMOND J. GORTE UNDER 37 C.F.R. § 1.132**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

I, Raymond J. Gorte, Ph.D., hereby declare the following:

1. I am a co-inventor of the above-captioned patent application ("the subject application"). My Curriculum Vitae is enclosed as **Exhibit A**. Among my credentials, I earned a Ph.D. in Chemical Engineering from the University of Minnesota, in Minneapolis, Minnesota. I am a senior technical advisor to Franklin Fuel Cells, the company seeking to commercialize the technology set forth in the above-captioned patent application..
2. I have performed research into catalysis and fuel cells relevant to the work described in this patent application as professor at the University of Pennsylvania. Franklin Fuel Cells was founded to move the research into the product phase.

3. It is my understanding that claims 2-19, 21-30., 55, 56, 58, 60, and 62-67 of the subject application are directed toward solid oxide fuel cells capable of operation with sulfur-containing hydrocarbon fuels.

4. I have reviewed the Office Action dated October 9, 2008. As I understand it, the Examiner has rejected independent claims 62-67 and those claims that depend from these claims for allegedly being obvious in light of the prior art, in particular U.S. Patents 5,445,903 (Cable) and 4,812,329 (Isenberg).

5. This declaration is made to demonstrate that fuel cells recited in claims 62-67 were not obvious at the time that the application was filed.

6. Based on my experience in the field of catalysis and fuel cells and my own observations and tests, the invention of the instant application achieves results that are unexpectedly superior to those of alternative devices in the field.

7. I understand that the Patent Office is of the view that although Isenberg discloses only operation with H<sub>2</sub>, CO, and CH<sub>4</sub> as fuels, devices that result from the hypothetical combination of Cable and Isenberg references could nonetheless operate using hydrocarbon fuels having two or more carbons ("C<sub>2</sub>+ hydrocarbons") and having a sulfur content of from about 1 to about 5000 ppm.

8. The Patent Office's position is mistaken. Based on my experience in the field, H<sub>2</sub>, CO, and CH<sub>4</sub> behave very differently from C<sub>2</sub>+ hydrocarbons when used as fuels in solid oxide fuel cells, and CH<sub>4</sub> would specifically behaves like CO, not like a C<sub>2</sub>+ hydrocarbon.

9. Based on my experience, a nickel-based fuel cell may operate on CH<sub>4</sub> or H<sub>2</sub>. Cells according to the references cited by the Patent Office, however, would form undesirable carbon deposits when run on C<sub>2</sub>+ hydrocarbon fuels. Because these deposits are difficult to avoid, one of skill in the art at the time of the subject application would not have used the

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devices described in either the Isenberg or Cable references in conjunction with C2+ hydrocarbon fuels.

10. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: January 26, 2009

/Raymond J. Gorte, Ph.D./  
Raymond J. Gorte, Ph.D.

Attachments:  
**Exhibit A**